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ABSTRACT

The effectiveness of an eight week college course for reading/study skills improvement was evaluated by pretesting and posttesting 152 students with the Nelson-Denny Reading Test and the Optimum Reading Achievement Test and running simple correlations between reading rate, comprehension, vocabulary, and 18 variables that included ACT scores, grade point averages, and subtest scores from the pretest/posttest instruments. The twelve general findings and conclusions that are enumerated and discussed in this document indicate that the reading program has significant positive effects on reading rate and comprehension regardless of the individual students' reading levels. Since all the students seemed to profit from the program, it is suggested that other colleges adopt similar systematic reading programs to help all students improve their reading skills. Tables of findings are included. (RI)

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THE RELUCTANT COLLEGIATE READER

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A PROJECT PRESENTED
TO THE RESEARCH COMMITTEE
OF TROY STATE UNIVERSITY

BY

CHARLIE W. PARKER

AND

RUDY M. ARGENTI

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CHAPTER I

INTRODUCTION

In the last ten years, there has been an increasing amount of research devoted to the area of reading. The bulk of this research has occured since 1966. Dare, based on results obtained with questionnaires sent to 559 two-year colleges, concluded that nearly all public two-year colleges provided some type of remedial instruction (English and mathematics as well as reading) and that most colleges refrained from using the term remedial and prefer to use such terms as developmental or guided study. Similarly, Dare found that while preliminary studies preceded the establishment of most programs, few colleges evaluated the reading programs once they were instituted.[1] The typical tendency has been to rely on the attitude of the faculty and students as to program effectiveness.

Lowe and Stefurak indicated from the results of a state reading improvement programs survey in Georgia colleges that in 30 of 58 schools replying, 21 reported that they were offering reading improvement programs.[2]

In general, the research indicates that the major purpose for college reading programs is to alleviate deficiencies found in the reading abilities of college age adults. Therefore, in this study the investigators attempted to evaluate program effect at the collegiate level. The investigation has specific concerns regarding

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[1]Dare, L.J. A study of remedial programs in public two-year colleges. (Doctoral Dissertation, Univ. of N.C. at Chapel Hill, 1970.) Dissertation Abstracts International, Feb., 1971, 31, 3896A. Ann Arbor: Univ. Microfilms, Order No. 71-3549.

[2]Lowe, A. J., & Stefurak, D. W., "The College Reading Improvement programs of Georgia: 1969-70, "Schick and May, 1970b, 118-124.

the factors of rate, comprehension and vocabulary. A subproblem would involve the correlation of selected test instruments commonly used in the reading area.

I. STATEMENT OF THE PROBLEM

The purpose of this study was to investigate the instructional effects of a program in reading on the selected components of comprehension, vocabulary and rate. The investigators sought to determine whether these components would be enhanced as a result of the reading classes which the subjects attended three times a week for the duration of the experiment or a total of eight weeks.

II. IMPORTANCE OF THE STUDY

The development of reading skills holds great promise in aiding each individual to attain his intellectual potential. Educators have long been concerned about developing the full potential of every child and as a consequence have dedicated their services to this effort. However, the investigators pose that if sufficient force had been applied in developing reading programs at all the sublevels of education, the need at the higher education level would be nil. A major weakness has been that the basic knowledge resulting from the experimentation has not been applied to the task of developing comprehensive reading programs for all children and adults.

The fact that little attention has been given to development of comprehensive reading programs at the Senior college level prompted this investigation. Specifically, the investigators

sought to question the effects of a systematic reading instructional program on selected factors that contribute to one's reading skill.

In addition, the investigators were concerned about the effectiveness of instruction as it applied to subgroups of students that were performing at various reading proficiency levels.

III. HYPOTHESIS

The main hypothesis of the study is stated in null form and reads: there is no statistically significant difference within the experimental subgroups on the selected reading components scores of rate, comprehension, and vocabulary.

IV. ASSUMPTION AND LIMITATIONS

The assumptions of this study were as follows:

1. The subjects selected for this study were from the same parent population.
2. The assumptions of randomness, normalcy, homoscedasticity, and linearity of data that underlie the use of the statistical techniques used in study were assumed by the investigators.

The limitations of the study were as follows:

1. The subjects were 152 students enrolled at Troy State University, Troy, Alabama.
2. The subjects were instructed in reading improvement during three 50 minute periods a week for 8 weeks.
3. The subjects were selected from contained readings

improvement classes at the University and without consideration of background or educational experience.

Inferences made by the investigators as a result of this study are confined to this sample of subjects and within the framework of the stated assumptions and limitations.

CHAPTER II

REVIEW OF LITERATURE

In a study by Parker, he reported the results of the Troy State University reading program by using the Optimum Reading Achievement Test (ORA). Parker's study suggested the potential use of the Optimum Reading Achievement Instrument as a quick screening device and as a pre- and post-test.[3]

Buffone, in interpreting the analysis of questionaire data obtained from 96 state colleges and universities indicated that "developmental aspects" apparently received major stress in college reading programs and that standardized achievement tests were used most frequently in selection of students for courses. According to Buffone, the majority of programs reportedly used a combination of methods.[4]

In support of reading programs, Kerstiens reported that in the El Camino College program point-percentile gains on standardized tests were substantial and that measurable progress, a low percentage of attrition, a diminishing flunking rate, and higher passing grades were evident as a result.[5]

In a further study, a group of 184 high-risk high school graduates participated in Project Speed (Summer Program for Educational Enrichment and Development) at three Georgia Junior

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[3]Parker, Charlie W., "TSC Reading Center Tops in State--U.S.A. Too!" Educational Monograph 409, Published by Psychotechnics, Inc., May, 1968.

[4]Buffone, Nicholas John, "A Survey of College and University Reading Programs and an Analysis of the Reading Program at the University of Oklahoma", Dissertation Abstracts, January, 1966.

[5]Kerstiens, G. Open, "Enrollment: challenge to the reading/study skills program," In Schick and May, 1970b, 106-112.

Colleges. This study found that those individuals who participated in a comprehensive reading, writing, studying and basic academic skills program scored significantly higher than a control group on 11 of 14 varibles. The Nelson-Denny was used as the criterion Test in this study.[6]

DiSalvi found that experimental groups of Newark State College freshmen who had participated in an evening reading and study techniques program obtained higher mean scores than did a control group on study orientation, level of comprehension, and speed of comprehension scores. He further notes differences found among all groups, including the controls, were not significant, except for "rate of comprehension".[7]

Fleischer, in a testing and remedial reading program at the Fashion Institute of Technology (New York), found that "upward" but not significant changes had occurred as a result of reading instruction.[8] Glenn, describing the reading programs at the community college level, reported that "almost all gained" in rate, vocabulary, and comprehension.[9] Ray investigating permanency of gains, found that two college reading program groups had each

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[6]Miller, T.K., Artenen, W.W., & Duncan, J.A., "High-risk students in junior college: a special program," Personnel and Guidance Journal, March, 1971, 47:537,543.

[7]DiSalvi, R.D., "An investigation of the relationship between a study techniques and reading improvement program and the academic performance of undergraduate evening students. (Doctoral Dissertation, University of Pennsylvania, 1970.) Dissertation Abstracts International, November, 1970, 31, 2174A. Ann Arbor: University Microfilms, Order No. 70-22,871.

[8]Fleischer, Ernest, "Reading Surveys and Their Implication in Freshman English Programs," Journal of the Reading Specialist, May 1966, 5:160-164.

[9]Glenn, Mrs. M.L., "The Improvement of Reading at the Community College Level," Journal of Developmental Reading, Summer, 1964, 7:318-321.

gained significantly in Nelson-Denny Reading Test scores at the end of the program. However, one of Ray's groups showed no loss when retested three months later. A second group from Ray's study was found to have maintained significant gains in rate and vocabulary when retested six months later. However, no significant gains were recorded in the total reading scores.

In a highly complex study, eye movement patterns of 190 subjects, selected at random from a Purdue University reading course population of almost one thousand, were found to have changed significantly during the course of instruction. The eye movement patterns were recorded with an electro-oculograph at the beginning and at the end of the sixteen week reading course. In this study by Ray, reading rate had changed significantly, but comprehension varible did not show any significant changes.[10]

In a program area when appraising objectives and validity of a reading course designed to be suitable for presentation to college freshmen, Schoenberg found significant Nelson-Denny Reading Test score gains for students at the end of a program. Statistical significant differences were found between grades in English courses taken the previous semester and between the instructional program and English course grades the following semester.[11]

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[10]Ray, Darrel D., "The Permanency of Gains Made in a College Reading Improvement Program," Journal of Educational Research, September, 1965, 59:17-20.

[11]Schoenberg, B.M., "The development and evaluation of a program for the teaching of reading in a junior college," (Doctoral Dissertation, Univ. of Houston), Dissertation Abstracts, Jan. 1970, 30: 2861A.

Stuart used teachers participating in a reading improvement program as an integral part of an NDEA institute in reading at Ohio University and found statistically significant increases in Nelson-Denny Reading Test rate and vocabulary scores.[12]

Johnson, Jacobson and Beaber reported test score gains in a group of college-bound rural high school students and that a reading improvement program indicated the vocabulary and comprehension gains were related to "genotypical" variables such as school attended and college selected.[13]

Whitehill and Rubin in their study used experimental groups of graduate and undergraduate students. The students were enrolled in free voluntary developmental reading courses. They used paper back books and showed a statistically significant words-per-minute gain when compare to controls which had received a more traditional program.[14]

Phillips' research yielded that neither the control nor any of the three instructional approaches (teacher guided, individualized, and audio-visual) used in a reading and study skills program with groups of disadvantaged black college freshmen

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[12]Stuart, A.J., "Improvement of teacher's reading proficiency", In C.A. Ketcham, Professional Variety in Reading, Syracuse, N.Y.: The College Reading Association, 1967.

[13]Johnson, J.C., II, Jacobson, M.D., & Beaber, J.D., "An analysis of reading proficiency and its improvement in university-accepted rural secondary students," In Schick and May, 1970a, 193-197.

[14]Whitehill, R.P., & Rubin, S.J., "Effectiveness of instrumental and traditional methods of college reading instruction," Journal of Experimental Education, Spring, 1971, 39:85-88.

appeared to be significantly more effective for improving level and speed of comprehension. Phillips' study did indicate that the Davis Reading Test with the individualized approach being more effective for positive modification of study habits and attitudes (SSHA).[15]

A comparison of the college reading programs involving various methods and approaches was conducted at the University of Missouri at Kansas City. It was found that a freshman group, which participated in a ten-weeks reading improvement course, made significant rate and comprehension gains as measured by the criterion test. The first semester grade-point average of the reading group was significantly higher than that of an orientation group (which had participated in an eleven-weeks, one-hour-a-week, non-credit course on notetaking, writing papers, taking tests, and planning study time, but no work on reading skills) and a control group which had not enrolled in a special class of any kind.[16]

Finally, inmates in two Ohio penitentiaries who used programmed textbooks in adult basic education courses were found by Carson to be able to show definite gains in reading

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[15]Phillips, G.O., Sr., "The relative effectiveness of three instructional approaches upon the reading, study habits and attitudes, and academic performances of disadvantaged black college freshmen," (Doctoral Dissertation, University of Pennsylvania, 1969), Dissertation Abstracts International, September, 1970, 31:1084A.

[16]Phillips, G.O., Sr., "Study habits and attitudes of disadvantaged students in a college reading and study skills program," In Schick and May, 1970b, 152-157.

vocabulary, comprehension, and total scores (ABE), at both easy and difficult levels.[17]

[17]Carson, J.E., "The effects of programmed instruction as a supplementary teaching aid in adult basic education at the Ohio State Reformatory. (Doctoral Dissertation, Ohio State University, 1970.) Dissertation Abstracts International, March, 1971, 31, 4441A. Ann Arbor: University Microfilms, Order No. 71-6951.

CHAPTER III

PROCEDURE

The purpose of this chapter is to describe the procedure used by the investigators in developing the following steps of the study: (1) the selection of the subjects and the formation of the subgroups, (2) the instructional program, (3) selection of the tests, (4) administration of the tests, and (5) treatment of the data.

Three subgroups were formulated for statistical purposes so as to determine the effects of instruction on the reading components of (1) rate, (2) comprehension, and (3) vocabulary. A description of each subgroup follows:

Experimental Group I. The subjects in this group were enrolled in reading improvement classes and were assigned to this group on the basis that they scored above the 50th percentile on the Nelson-Denny Comprehension Reading Test.

Experimental Group II. The subjects in this group were enrolled in reading improvement classes and were assigned to this group on the basis that they scored between the 20th and 49th percentile on the Nelson-Denny Comprehension Reading Test.

Experimental Group III. The subjects in this group were enrolled in reading improvement classes and were assigned to this group on the basis that they scored below the 20th percentile on the Nelson-Denny Comprehension Reading Test.

It should be noted from outset that the groups were statistically organized on the basis of their performance. Physically, the reading

instructional classes included students who functioned at each of the three reading levels as defined by the criteria used by the investigators to place subjects into the subgroups. In other words, for instructional purposes the groups were heterogeneous and for statistical purposes the subgroups were homogenously arranged on the basis of their performance on the criterion test.

One of the investigators served as the instructor throughout the duration of the experiment. This investigator interacted with all participants for the same amount of time each week. This procedure was followed in order to control the possibility of the "Hawthorne Effect". Correspondently, the subjects were not informed of the fact that they were participating in an experiment, nor did the investigators make any attempt to motivate any one subgroup differently. The instructor attempted to use standard procedures with each of the classes. Table I represents the experimental design of the study.

I. SELECTION OF SUBJECTS

The subjects were selected from contained University classes in Reading Improvement. The subjects were classified in the subgroups on the basis of an initial score in reading comprehension on the Nelson-Denny Reading Test. Academically, the subjects ranged from freshmen to seniors. The subjects were placed into the experimental subgroups commensurate with their performance. The investigators were concerned only with the "within group" effects as a result of instruction. Therefore, no attempt was made to equate

TABLE I

Design of Study

Groups	N	Pre Test	Treatment	Post Test
Group I	44	Reading Test[a,b]	8 weeks of reading improvement[c]	R-T[a,b]
Group II	45	Reading Test[a,b]	8 weeks of reading improvement[c]	R-T[a,b]
Group III	63	Reading Test[a,b]	8 weeks of reading improvement[c]	R-T[a,b]

[a] All subjects took Nelson Denny Reading Test

[b] All subjects took Optimum Reading Achievement Test

[c] All subjects completed 8 weeks of Reading Improvement Instruction between pre and post-test dates.

the groups or to compare or contrast the progress "among" the groups tested. The reader should note that the groups could be considered bias in that the grouping procedure followed was for the purpose of studying the subjects changes in performance. The non-random assignment of subjects to the groups enabled the investigators to include initially those subjects more homogenious in their reading comprehension performance. Thus, it was assumed from the outset of the study that the groups might at the conclusion of the experiment differ in variability and that this would be due primarily to the fact that initially the groups were different. From a statistical point of view, it was to the investigators' advantage to use the "paired observations" technique rather than "independent observations" assigned at random as the data for ultimate analysis was via the "t" ratio. It was further assumed by the investigators that this procedure would not effect the experimental conditions to any great extent, since each group received the same instructional program based on developing the specific reading factors of rate, comprehension, and vocabulary.

II. INSTRUCTIONAL PROGRAM

The subjects comprising the experimental groups received instruction in reading improvement during three 50 minute periods a week for eight weeks. A detailed outline of the instructional program is included in Appendix A. Each lesson was presented in

progression from simple to complex and on the basis of daily performance by the subjects. In essence, each subject proceeded at his own rate and aspirational level.

III. SELECTION OF TESTS

The tests used to evaluate the effectiveness of reading instruction were the Optimum Reading Achievement Series (ORA) and The Nelson-Denny Reading Test. The ORA consists of 20 timed essays, each written at grade level with a range of grade seven to adult. The vocabulary, comprehension, and rate checks of the ORA enable the teacher to determine the optimum reading level of each subject. The comprehension factor being the controlling element in the subject's reading improvement. The ORA is a widely used instrument in the field and its adaptability to local norms characterizes its usage. The tests are nonconsumable with each subject keeping personal achievement charts. For the purpose of this investigation, essay numbers One and Two in Book III were selected for the pre-test and numbers Nineteen and Twenty for the post-test of the experiment.

The Nelson-Denny (ND) Reading Test was selected for its ease of administration. It is a standardized test with two forms in the revised edition, each containing 100 items for vocabulary and 36 to measure rate. In the ND, the comprehension score is given a double weighted value in arriving at a total score. To reiterate, in this investigation the subjects were subgrouped by performance

on the basis of the comprehension score. The ND is designed to be used in grades nine through sixteen and is readily administered in a single class period.

To further delineate the subgroups, a "percentage band" from the ND Comprehension subtest was used to differentiate the subjects. The difficulty range for the ND is designed to make certain that the material is of sufficient difficulty to challenge the superior reader while providing material sufficiently easy for students having major difficulty with reading.

Additionally, the ND as a test instrument was chosen because of the accumulation of meaningful local data over a period of seven years with University reading improvement classes. The purpose of the test according to the editors are designed to predict general scholastic ability, to section incoming college or high school classes and to diagnose general reading skills.

The validity for items on the revised A and B forms in the reading comprehension subtest have a range of 25-67 and a mean of 44.6 on Form A and 45.3 on Form B. The difficulty level for items in the reading comprehension subtest show a range of 29-95 and a mean of 71.2 on Form A and 71.4 on Form B.

The reliability coefficients range from .81 on the comprehension part to .93 on the vocabulary part of the Nelson-Denny.

IV. ADMINISTRATION OF THE TESTS

The Optimum Reading Achievement Tests (ORA)were administered

according to the suggested directions in the teacher's manual. The rate part of the test was timed by using the Tachomatic 500 timing film.

The Nelson-Denny Reading Test was administered strictly according to the standardized directions. For the purpose of this investigation, Form B was used as the pre-test and Form A as the post-test. The investigators concluded that the reliability and validity coefficients for both forms were high enough to use alternate forms and thereby eliminate the possibility of test learning during the pre-test and post-test period.

V. TREATMENT OF THE DATA

The score for each subject was determined by the criteria for each subtest on the Nelson-Denny and Optimum Reading Achievement Tests. The scores were summed to give a total score within each subtest item, e.g. rate, comprehension, and vocabulary.

The subtest score for each individual and group was treated statistically. The "t" ratio was used in the form of a one-way classification design with only the "within group" effects being analyzed. As previously stated, this procedure enabled the investigators to determine treatment effects "within" each of the groups and to ascertain any changes that might have occured from pre-test to post-test.

Design of the experiment necessitated the "matched" or "paired observation" technique. Such a design occurs when measurement of the same individuals is undertaken under different experimental conditions. To further illustrate,

the design of the experiment called for the data to be treated as "paired observations". The investigators studied a subject's reading score which had been measured with a reading instructional instrument in order to determine before and after effects of the program on the performance. The investigators compared several sets of data in order to gain some information about the relative importance of a reading instructional program as the determining factor on reading rate, comprehension, and vocabulary. Since the paired scores were on the same individuals, one might expect the average reading scores to be similar (not significantly different). However, in the use of the "t" ratio it was assumed that no score in the first sample group had any influence on the value of and score in the second or third groups. The amount of chance variability expected to occur between means is considerably less than it would be if these scores were randomly selected from totally unrelated population samples. The "paired observation" technique considers this reduction in sampling variation. In short, because of the commonality of factors contributing to the values of both scores derived from paired observations, one expects less "chance difference", "less sampling variation", than among independent observations. In all other respects, the "t" ratio that results from this process is the same statistic with the same application and interpretation.

Underlying the "t" ratio are certain assumptions that should be met in order for the operations to be valid. It should be

noted, however, that everyone of these has at some time been violated by researchers with no grievous consequences. The "t" ratio is called a "robust" test, which in essence means that the strict assumptions normally regarded as necessary for its use, computation and logic can be studied without effecting drastically the final statistical inference.[18]

18 R.J. Senter, Analysis of Data. (Glenview, Illinois: Scott, Foresman and Company, 1969), pp. 195-204.

CHAPTER IV

ANALYSIS OF DATA

The data were analyzed to determine the main effects of reading instruction on three experimental subgroups of University students. Each subgroup was studied in order to determine changes that occurred during the eight week instructional program.

The analysis of data collected consisted of within group comparisons on the reading components of rate, comprehension, and vocabulary. A statistical analysis was computed on three subtest scores that comprise the Nelson-Denny and the Optimum Reading Achievement Tests. The procedure was followed in order to ascertain the changes occurring between the pre-test and post-test periods.

The "t" ratio was used to make the statistical analysis. The technique employed in the design of the study evaluated the changes occurring within each group on each subtest during the period that occurred from pre-test to post-test.

As previously stated, the basic assumptions underlying the use of the "t" ratio were assumed by the investigators. No attempt was made to test the validity of the assumptions. A nonrandom procedure was used to group the subjects by performance level. The investigators intentionally grouped the subjects by performance initially as the ultimate analysis involved paired observations as opposed to independent observations.

The "t" ratio was applied to the data that was in discrete form. Further computations were studied using a simple correlation technique. The latter procedure was used to enable the

investigators to determine what relationship existed, if any, among the varible factors included in this investigation. The factors studied in the multiple correlation were vocabulary, rate, comprehension, ACT subtest scores and grade point average.

I. RESULTS OF WITHIN GROUP COMPARISONS

A summary of the Mean Scores and Standard Deviations for the factors studied is included in Table II. A graphic illustration for pre-test and post-test scores for each group on the criterion measurement for the rate, comprehension, vocabulary test (ORA) is presented in Figures 1, 2, and 3. The same data illustration for the Nelson-Denny rate, comprehension, vocabulary tests is presented in Figures 4, 5, and 6. A summary table for the pre-test and post-test scores for each group on the ORA is presented in Table III. For the same data on the Nelson-Denny, this data is presented in Table IV.

The calculated "t" ratio for rate test (ORA) using the paired observations technique was statistically significant at 0.01 level of confidence. This indicated that there was a significant difference between the pre-test and post-test rate scores for each group tested. Therefore, the hypothesis which stated that no statistically significant difference expected within the groups on the factor of rate scores of students enrolled in the experimental groups receiving the instructional program in reading was not accepted. The data yielded similar findings on the rate factor on the Nelson-Denny Rate Test.

The calculated "t" ratios for vocabulary and comprehension

TABLE II

A SUMMARY TABLE OF THE MEAN SCORES AND STANDARD DEVIATIONS FOR THE VARIABLES STUDIED IN THE SAMPLE GROUPS.

MEAN SCORES AND STANDARD DEVIATIONS

Group I			Group II			Group III		
ORA[a]	$\bar{x}$[e]	$\bar{s}$	ORA	$\bar{x}$	$\bar{s}$	ORA	$\bar{x}$	$\bar{s}$
Rate	172.61	(34.52	149.68	(34.9)		138.03	(26.34)	
Comp.	80.34	(11.63)	73.33	(11.05)		66.90	(13.92)	
Voc.	72.38	(10.86)	66.55	(15.58)		58.49	(14.96)	
N=44			N=45			N-63		
N-D[b]			N-D			N-D		
Rate	186.79	(41.81)	157.13	(42.58)		147.98	(44.73)	
Comp.	46.36	(7.1)	33.08	(3.05)		21.33	(6.93)	
Voc.	39.20	(8.52)	31.22	(9.25)		24.09	(9.20)	
N=44			N=45			N=63		
ACT[c]			ACT			ACT		
Eng.	20.77	(2.97)	18.0	(2.49)		16.63	(4.02)	
Math.	19.57	(5.38)	18.55	(4.23)		15.55	(5.51)	
Soc.S.	21.05	(5.77)	17.58	(4.56)		14.0	(4.57)	
Nat.Sc.	22.42	(5.16)	18.47	(5.07)		16.68	(4.23)	
Compos.	21.11	(3.60)	18.17	(2.83)		15.84	(3.20)	
N=35			N=34			N=38		
GPA[d]			GPA			GPA		
1.50	(0.73)		1.33	(0.60)		0.97	(0.60)	
N=44			N=45			N=63		

[a] Optimum Reading Achievement

[b] Nelson-Denny

[c] American College Test Scores

[d] Grade Point Average prior to taking course in Reading Improvement

[e] $\bar{x}$ = Mean - $\bar{s}$ - Standard and Deviation

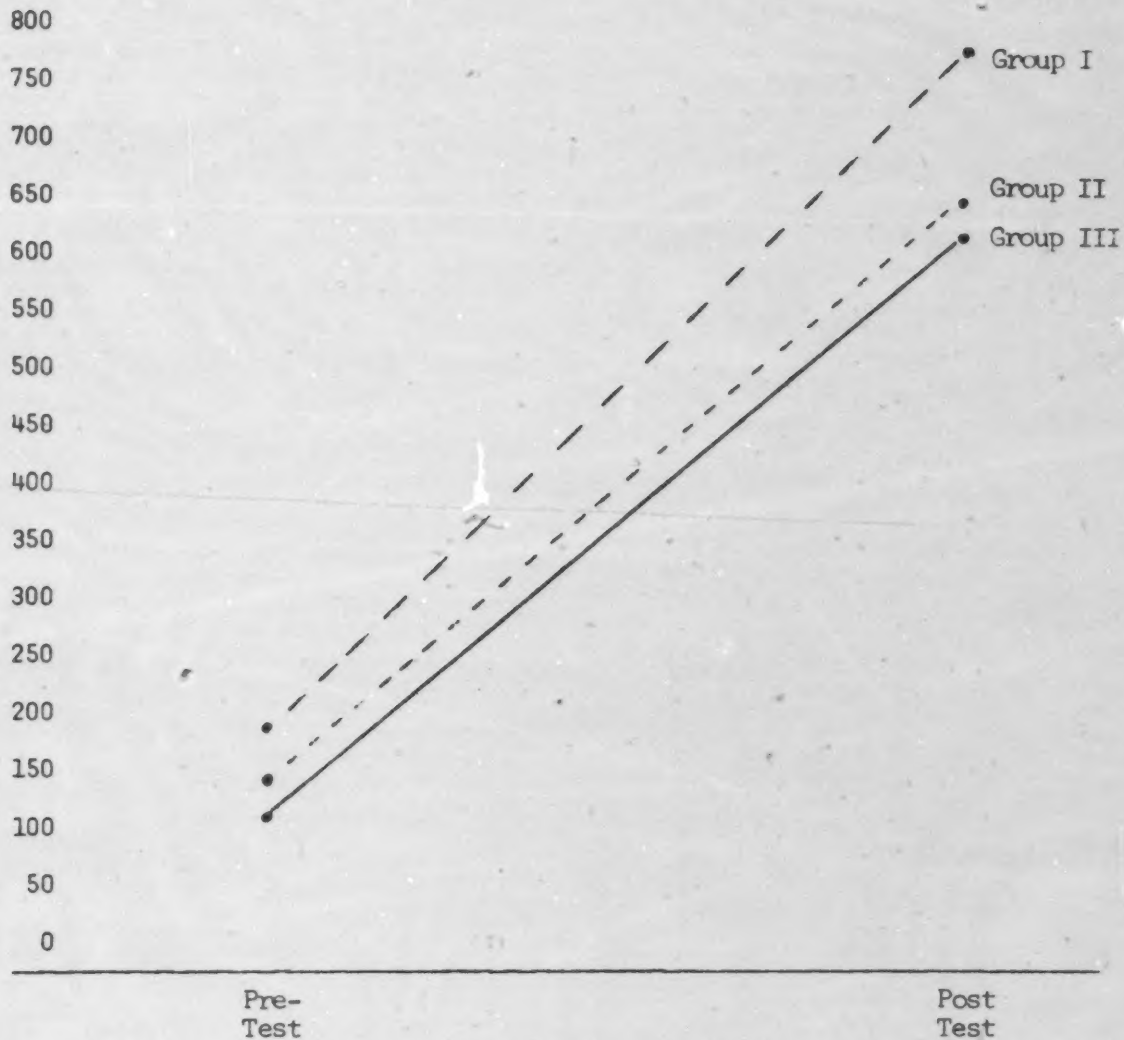

Figure 1. Pre and Post Test mean scores for each of the three groups on the ORA Test, (Rate)

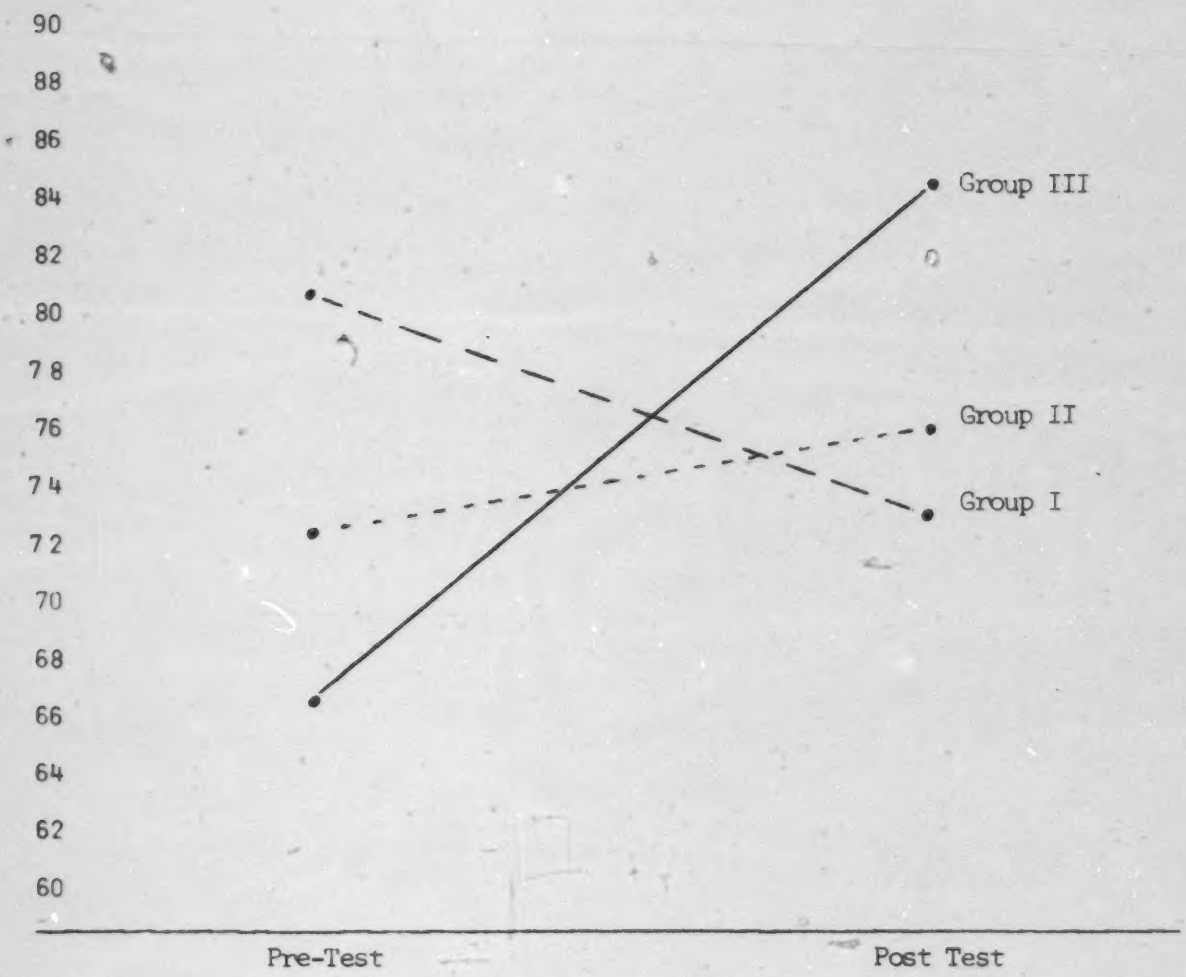

Figure 2. Pre and Post Test mean scores for each of the three groups on the ORA (Comprehension)Test

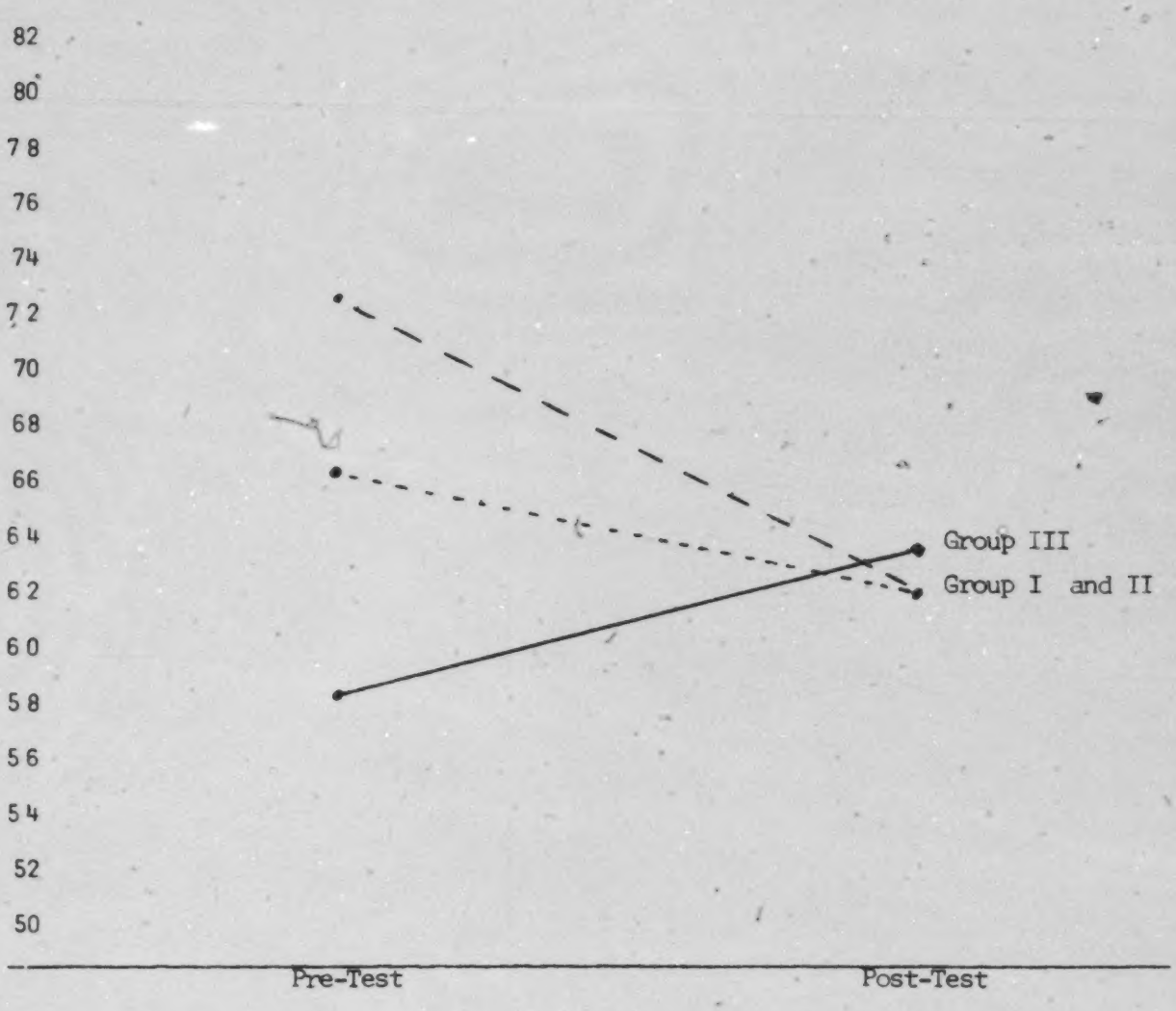

Figure 3. Pre and Post mean scores for each of the three groups on the ORA (vocabulary) Test.

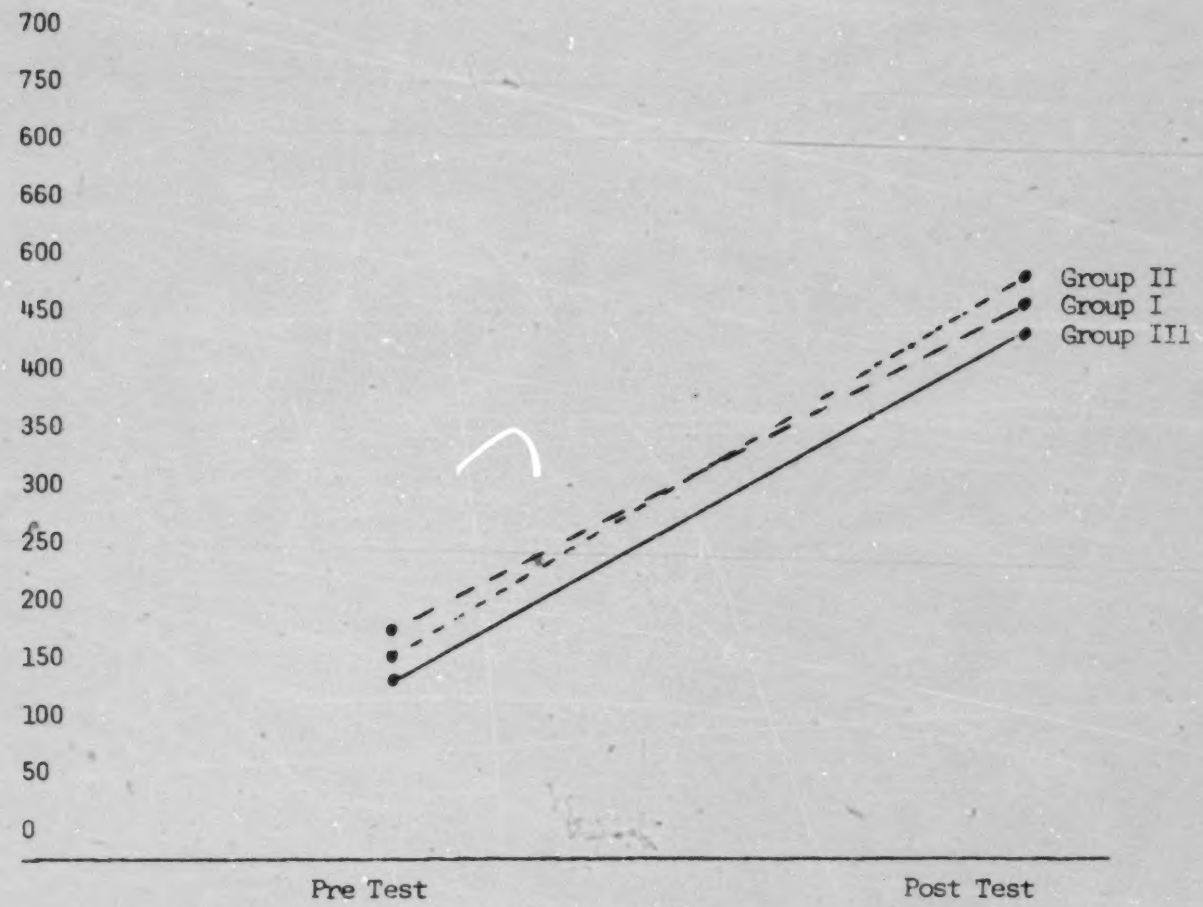

Figure 4. Pre and Post test scores for each of the three groups on the Nelson Denny Reading Rate Test.

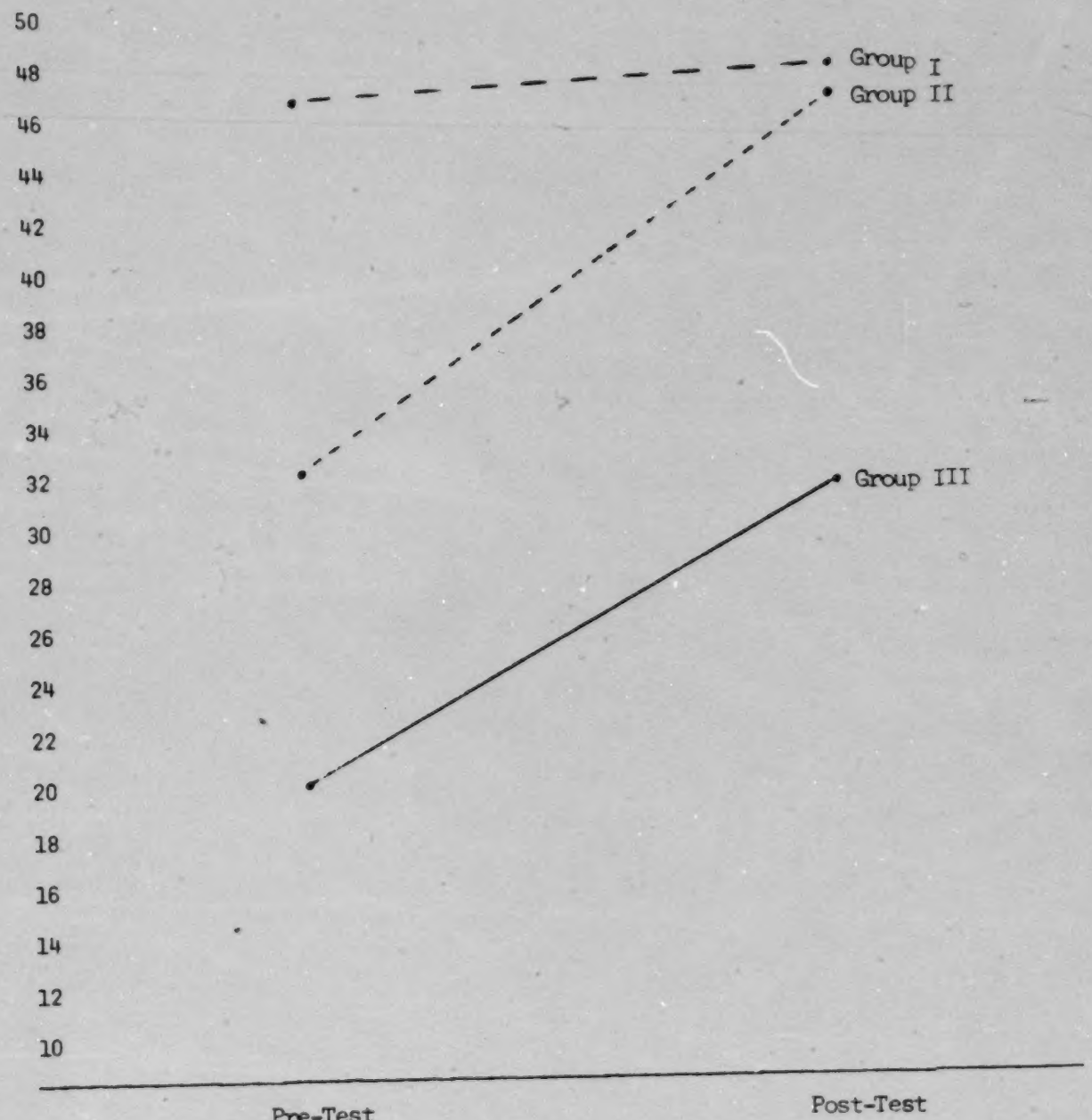

Figure 5. Pre and Post Test scores for each of the three groups on the Nelson Denny Reading (comprehension) Test.

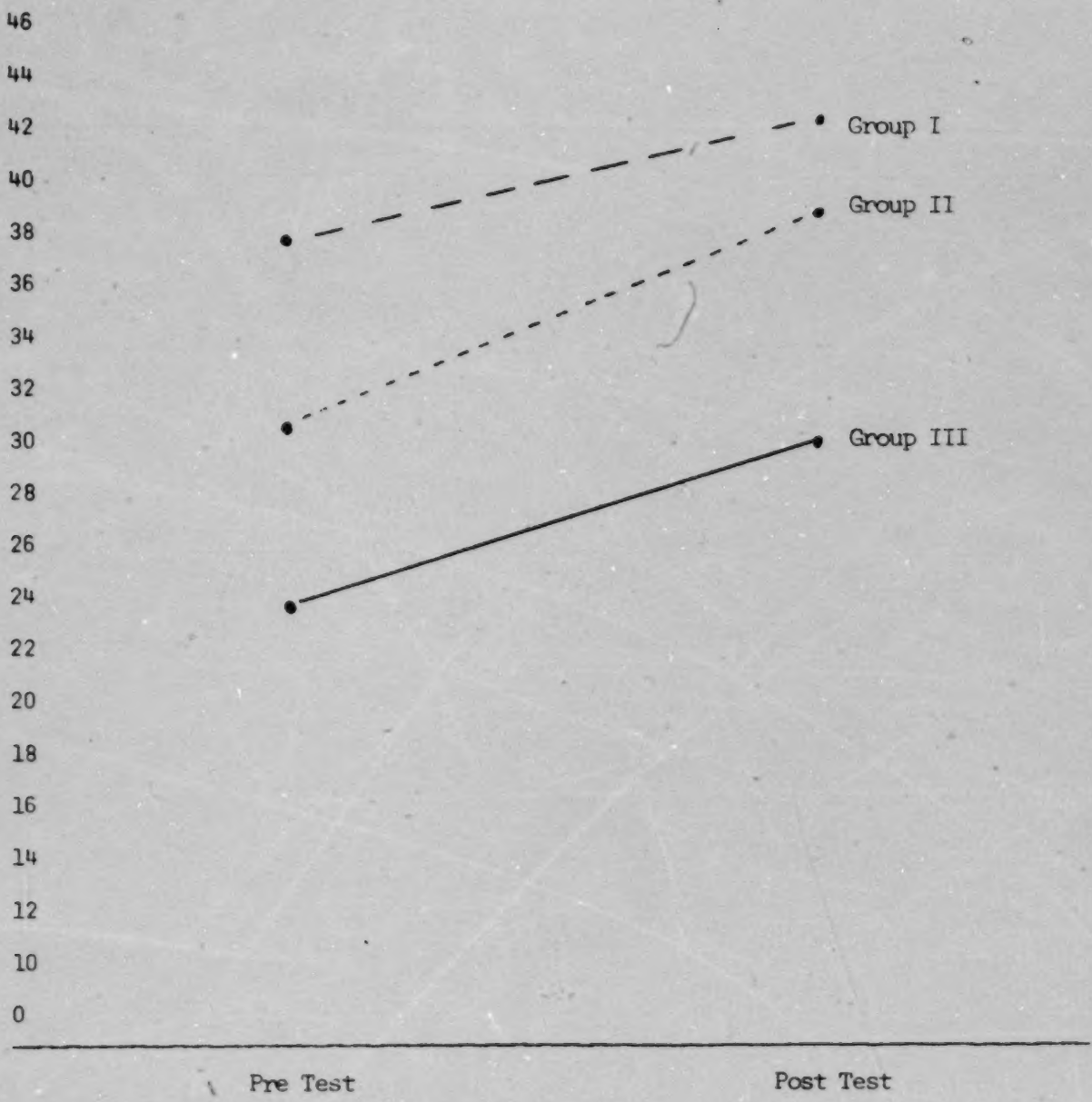

Figure 6. Pre and Post Test scores for each of the three groups on the Nelson-Denny Reading (vocabulary) score.

TABLE III

A SUMMARY TABLE FOR PRE-TEST
AND POST-TEST SCORES FOR EACH
GROUP ON THE OPTIMUM READING ACHIEVEMENT TEST

GROUPS	PRE-TEST MEAN	POST-TEST MEAN
I		
Rate	172.61	754.38 **
Comprehension	80.34	72.36
Vocabulary	72.38	62.50
II		
Rate	149.68	643.77 **
Comprehension	73.33	75.44
Vocabulary	66.55	64.44
III		
Rate	138.63	629.92 **
Comprehension	66.90	83.30
Vocabulary	58.49	64.92

** Indicates statictial significance at the 0.01 level of confidence.

TABLE IV

A SUMMARY TABLE FOR PRE-TEST
AND POST-TEST SCORES FOR EACH
GROUP ON THE NELSON - DENNY READING TEST

GROUPS	PRE-TEST MEAN	POST-TEST MEAN
I		
Rate	186.79	449.22 **
Comprehension	46.36	47.59
Vocabulary	39.20	44.22
II		
Rate	157.13	475.57 **
Comprehension	33.08	46.37 *
Vocabulary	31.22	40.77
III		
Rate	147.98	445.28 **
Comprehension	21.33	35.28 *
Vocabulary	24.09	31.06

** Indicates statistical significance at 0.01 level of confidence.
* Indicates statistical significance at 0.05 level of confidence.

yielded statistically significant data in group II and III on the Nelson-Denny Comprehension subtest. It should be noted that the comprehension subtest on the Nelson-Denny has high reliability and validity coefficients due to the total number of items on the test. Also, the Nelson-Denny comprehension subtest is most important to the study in that it was used to group the subjects.

The factor of "rate of comprehension" was studied by the investigators. This factor is the change that occurs between pre- and post-test by using both the factors of rate and comprehension in order to determine the rate of comprehension material. In each group, a statistically significant "t" ratio was found at the 0.01 level of confidence. This data is presented in Table V. A graphic illustration of these results is found in Figure 7.

II. RESULTS OF INTER-CORRELATION STUDY

The data were analyzed by using a simple correlation technique. Table VI presents the correlation matrix for Group I subjects. For this group, several correlations exceed the confidence limit at both the 0.01 and 0.05 levels. This finding indicates at the 0.01 level there is less than one chance in one hundred that a coefficient of correlation as much as 0.372 or 0.288 at 0.05 level might arise due to sampling variation. The computed "r" value exceeds the Table values cited in a number of combinations in the matrix for Group I subjects. Therefore, one can assume that these associations can be considered statistically significant relationships for

Table V

Pre-Test and Post-Test
Scores for Each Group
On Rate of Comprehension

Groups	Pre-Test Mean	Post-Test Mean
I	138.67	545.87**
II	109.76	485.66**
III	92.78	518.22**

** Indicates that t-ratio is statistically significant at the 0.01 level of confidence.

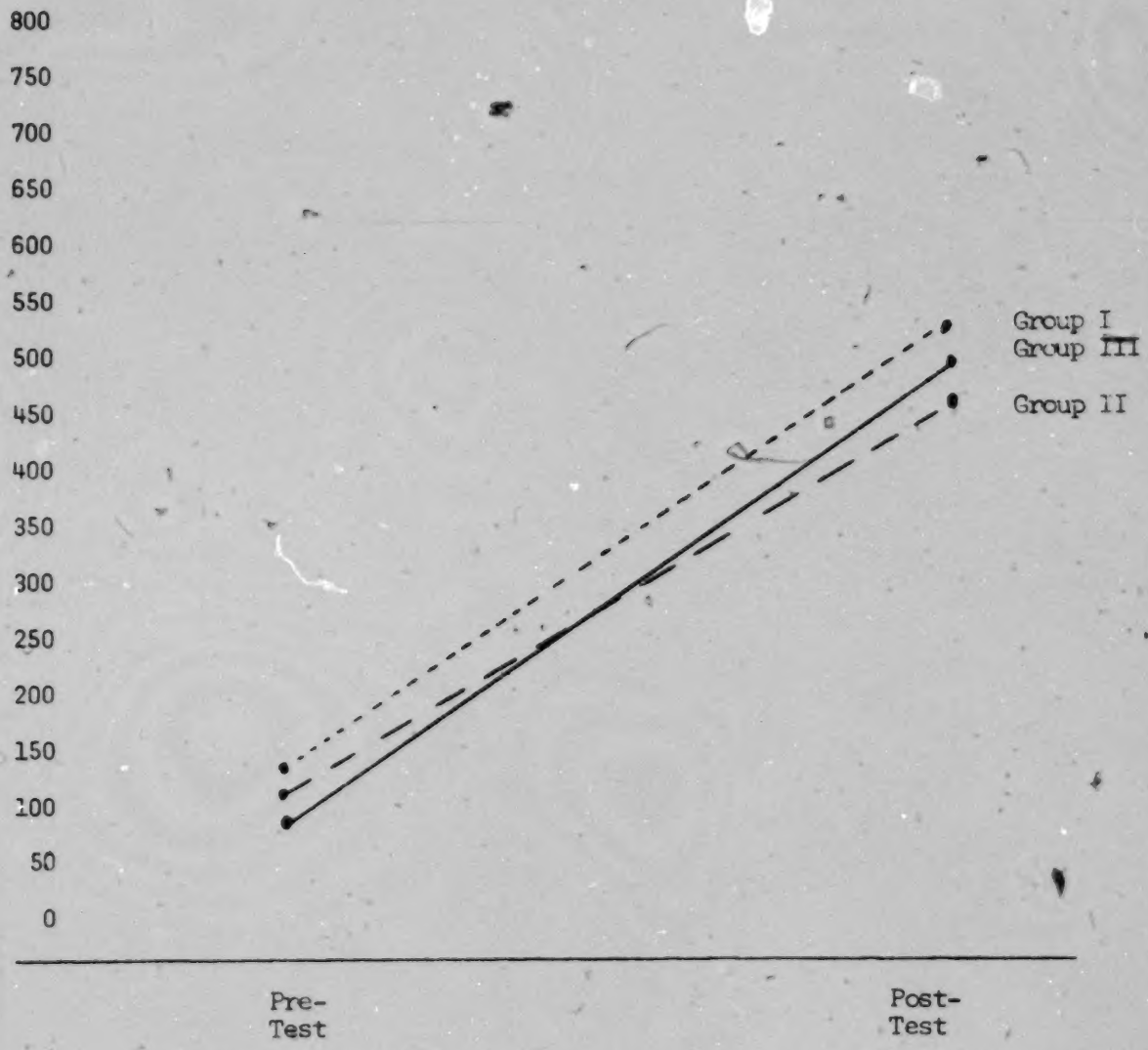

Figure 7. Pre and Post Test mean scores for each of the three groups on the ORA Test, (Rate) of comprehension

Table VI

Correlation Matrix for Group I

	1	2	3	4	5	6	7	8	9	10	11	12	13
1	1.000	0.537**	0.426**	0.400**	0.235	0.145	0.654**	0.519**	0.511**	0.228	0.044	0.085	0.156
2		1.000	0.563**	0.324*	0.382**	0.260	0.534**	0.441**	0.453	0.258	0.356*	0.340*	0.043
3			1.000	0.359*	0.350*	0.343*	0.377**	0.672**	0.596**	0.274	0.356*	0.433**	0.152
4				1.000	0.315*	0.261	0.468**	0.455**	0.482**	0.384**	0.347*	0.367*	0.105
5					1.000	0.719	0.221	0.402**	0.239	0.474**	0.629**	0.576**	-0.020
6						1.000	0.173	0.343*	0.312*	0.466**	0.579**	0.530**	-0.074
7							1.000	0.607**	0.663**	0.282	0.201	0.309*	0.085
8								1.000	0.560**	0.345*	0.358	0.408**	0.194
9									1.000	0.197	0.221	0.435**	0.110
10										1.000	0.767**	0.756**	0.157
11											1.000	0.894**	0.168
12												1.000	0.096
13													1.000
14													
15													
16													
17													
18													

* Correlation-ratio statistically significant at 0.05 level of confidence
** Correlation-ratio statistically significant at 0.01 level of confidence

Variables Included in the Correlation Matrix

1. ORA Rate Pre-Test
2. Comprehension
3. Vocabulary
4. ORA Rate Post-Test
5. Comprehension
6. Vocabulary
7. Nelson-Denny Rate-PreTest
8. Comprehension
9. Vocabulary
10. Nelson-Denny Rate-PostTest
11. Comprehension
12. Vocabulary

Table VI

Correlation Matrix for Group I

	14	15	16	17	18
1	0.146	0.249	0.227	0.209	0.175
2	0.040	0.101	0.088	0.070	0.245
3	0.203	0.297	0.223	0.230	0.183
4	0.071	0.168	0.140	0.133	0.024
5	-0.139	-0.073	-0.150	-0.106	0.102
6	-0.175	-0.051	-0.159	-0.127	0.174
7	0.017	0.158	0.162	0.112	0.351*
8	0.202	0.220	0.202	0.214	0.388**
9	0.081	0.243	0.196	0.166	0.413**
10	0.152	0.160	0.099	0.147	0.223
11	0.060	0.167	0.075	0.118	0.135
12	0.021	0.196	0.082	0.093	0.176
13	0.879**	0.874**	0.914**	0.963**	0.208
14	1.000	0.790**	0.843**	0.920**	0.144
15		1.000	0.934**	0.946**	0.006
16			1.000	0.972**	0.078
17				1.000	0.117
18					1.000

13. ACT Test English
14. Mathematics
15. Social Science
16. Natural Science
17. ACT Composite
18. Grade Point Average

this group of subjects as classified and organized into Group I and based on the fact that their performance was above the 50th percentile on the ORA comprehension subtest.

The significance of a coefficient of correlation (r) can be evaluated on the basis of a hypothesis that assumes a population correlation equals zero. The number of "r" (2 variables) that might arise due to chance can be tested. The number of degrees of freedom is equal to N-nr when "N" equals the number of groups or pairs and "nr" the number of variables. In Group I, there were 44 subjects or 44-2. When using this formula and in testing the hypothesis the actual correlation is plotted against a predetermined confidence level based on the appropriate degrees of freedom as derived from formula N-nr.

Tables VII and VIII present the correlation data for Groups II and III. As in the case of Group I, there were a number of statistically significant associations. However, these associations deminished from 60 statistically significant correlations found in Group I subjects to 20 in Group II and 28 in Group III. In all groups, it should be noted that for those subjects that had the ACT there was a statistically significant relationship found among subtest items in the ACT. This substantiates the high intertest validity and reliability for the subtest components of the ACT.

Table VII

Correlation Matrix for Group II

	1	2	3	4	5	6	7	8	9	10	11	12
1	1.000	-0.054	0.180	0.241	0.005	0.207	0.527**	-0.090	0.124	0.046	0.283	0.401
2		1.000	0.377**	-0.074	-0.003	0.222	0.396**	0.037	0.378**	0.003	0.241	0.370*
3			1.000	0.015	0.094	0.183	0.125	0.030	0.464**	-0.073	0.253	0.551**
4				1.000	-0.159	0.033	0.285	-0.126	-0.135	0.467	0.253	0.551**
5					1.000	0.494**	0.059	-0.001	0.283	-0.190	0.278	0.266
6						1.000	0.249	-0.154	0.255	-0.179	0.296*	0.282
7							1.000	0.038	0.116	0.082	0.201	0.181
8								1.000	0.451	-0.124	0.161	0.252
9									1.000	-0.029	0.416	0.623**
10										1.000	0.141	0.218
11											1.000	0.657**
12												1.000
13												
14												
15												
16												
17												
18												

* Correlation-ratio statistically significant at 0.05 level of confidence
** Correlation-ratio statistically significant at 0.01 level of confidence

Variables Included in the Correlation Matrix

1. ORA Rate Pre-Test
2. Comprehension
3. Vocabulary
4. ORA Rate Post-Test
5. Comprehension
6. Vocabulary
7. Nelson-Denny Rate-PreTest
8. Comprehension
9. Vocabulary
10. Nelson-Denny Rate-PostTest
11. Comprehension
12. Vocabulary

Table VII

Correlation Matrix for Group II

	13	14	15	16	17	18
1	0.178	0.144	0.212	0.180	0.186	0.323*
2	0.243	0.260	0.353*	0.319*	0.312*	-0.232
3	0.019	-0.079	0.088	0.038	0.017	-0.069
4	0.019	-0.079	0.088	0.038	0.017	0.154
5	-0.067	-0.171	0.012	-0.043	-0.069	0.113
6	0.095	0.049	0.063	0.059	0.071	0.087
7	-0.047	-0.115	-0.046	-0.135	-0.086	0.449
8	-0.141	-0.184	-0.032	-0.072	-0.114	0.209
9	0.095	-0.040	0.128	0.086	0.072	0.140
10	-0.055	-0.078	-0.045	-0.096	-0.077	-0.029
11	-0.079	-0.070	0.077	-0.025	-0.021	0.047
12	0.031	-0.060	0.144	0.078	0.049	-0.002
13	1.000	0.899**	0.861**	0.835*	0.942**	0.097
14		1.000	0.863**	0.866**	0.955**	-0.038
15			1.000	0.876**	0.952**	0.019
16				1.000	0.942**	-0.095
17					1.000	-0.004
18						1.000

13. ACT Test English
14. Mathematics
15. Social Science
16. Natural Science
17. ACT Composite
18. Grade Point Average

Table VIII

Correlation Matrix for Group III

	1	2	3	4	5	6	7	8	9	10	11	12
1	1.000	0.207	-0.041	0.203	0.043	0.016	0.473**	0.143	0.142	0.163	0.112	0.187
2		1.000	0.550**	0.020	-0.110	0.215	0.065	0.255	0.324**	0.077	0.236	0.240
3			1.000	-0.071	-0.031	0.382**	-0.071	0.171	0.326**	0.084	0.066	0.172
4				1.000	0.267*	0.167	-0.040	0.056	0.186	0.358**	0.075	0.164
5					1.000	0.133	0.104	0.162	0.005	0.201	-0.053	0.021
6						1.000	-0.088	-0.111	0.084	0.044	0.165	0.186
7							1.000	0.266*	-0.032	0.0125	0.093	0.103
8								1.000	0.631**	0.122	0.409**	0.502**
9									1.000	0.116	0.477**	0.757**
10										1.000	0.362**	0.250*
11											1.000	0.573**
12												1.000
13												
14												
15												
16												
17												
18												

* Correlation-ratio significant at 0.05 level of confidence
** Correlation-ratio significant at 0.01 level of confidence

Variables Included in the Correlation Matrix

1. ORA Rate Pre-Test
2. Comprehension
3. Vocabulary
4. ORA Rate Post-Test
5. Comprehension
6. Vocabulary
7. Nelson-Denny Rate-PreTest
8. Comprehension
9. Vocabulary
10. Nelson-Denny Rate-PostTest
11. Comprehension
12. Vocabulary

Table VIII

Correlation Matrix for Group III

	13	14	15	16	17	18
1	-0.046	-0.156	-0.119	-0.046	-0.098	0.074
2	-0.045	-0.026	0.016	0.028	0.004	-0.239
3	0.001	0.041	0.007	0.032	0.040	-0.191
4	-0.112	-0.075	-0.083	-0.080	-0.109	0.000
5	0.012	0.042	0.057	0.052	0.047	0.177
6	0.092	0.058	0.103	0.104	0.098	0.087
7	0.021	-0.035	-0.038	0.004	-0.000	0.094
8	0.098	0.121	0.154	0.111	0.097	0.078
9	0.088	0.021	0.119	0.116	0.058	0.062
10	0.171	0.201	0.057	0.167	0.134	0.111
11	0.241*	0.204	0.260*	0.218	0.218	0.125
12	-0.086	-0.117	-0.062	-0.084	-0.116	0.097
13	1.000	0.861**	0.851**	0.935**	0.944**	0.219
14		1.000	0.835**	0.900*	0.935**	0.152
15			1.000	0.895**	0.923**	0.145
16				1.000	0.966**	0.109
17					1.000	0.140
18						1.000

13. ACT Test English
14. Mathematics
15. Social Science
16. Natural Science
17. ACT Composite
18. Grade Point Average

V. SUMMARY, CONCLUSION AND DISCUSSION

This study was concerned with the within group effects of reading instruction on the factors of rate, vocabulary and comprehension.

The experimental design was a simple one-way classification model with the instructional program being the treatment effects for the experiment. The groups were organized on the basis of performance on the criterion test. Each group took an initial test previous to the experimental eight week period. Upon the completion of the experiment, the groups were retested.

The analysis of data revealed a statistically significant difference on the rate portion of the test. Additionally, a statistically significant difference was found on the comprehension factor for groups II and III on the Nelson-Denny Test. Furthermore, the varible factor of rate of comprehension or the speed at which one comprehends material was found to be statistically significant in all groups. Therefore, the hypothesis of the study that pertained to rate factor was not accepted. The hypothesis that dealt with the rate of comprehension similarly was not accepted for all groups. For groups II and III the hypothesis for the comprehension factor was not accepted as a result of the change that occurred in these groups.

The correlation study yielded several statistically significant relationships. Therefore, the hypothesis as it pertained

correlation study was not accepted. In general, the correlation data yields statistically significant data at 0.01 level, mostly in support of inter-test correlation.

As a result of analyzing the data collected in this investigation, the following conclusions are drawn within the stated limitations:

1. Selected factors that contribute toward reading success can be significantly enhanced as a result of a multifaceted reading program.

2. The factor of rate (reading speed) is greatly enhanced as a result of systematic instruction.

3. The factor of comprehension developed more significantly in less skilled readers than in the superior readers as a result of systematic instruction. This finding relates to the teaching methodology which emphasizes speed more with superior students than with less skilled individuals where the emphasis is placed on comprehension.

4. Systematic reading instruction effects statistically the rate of comprehension material regardless of reading level.

5. Nelson-Denny comprehension test, a criterion test, has a statistically significant relationship with grade point average in Group I subjects. (Those subjects who performed above 50th percentile.)

6. Nelson-Denny rate and vocabulary test relates statistically at 0.01 level to grade point average in the Group I subjects.

7. The rate pre-test of the ORA has statistically significant relationship with the entire battery of the Nelson-Denny with Groups I and II. (Those who fell above the 20th percentile.)

8. The rate post-test of the ORA (after instruction) has statistically significant relationship with the post-test scores on the Nelson-Denny rate test for the low performers. (Group III and below 20th percentile.)

9. The ORA pre-test of comprehension relates statistically to ACT composite score for Group II subjects. (Between 20th and 50th percentiles.)

10. There is a statistically significant relationship between the Nelson-Denny comprehension post-test scores and ACT English score for Group III subjects. (Below 20th percentile.)

11. The ORA test battery is a valuable screening instrument and yields statistically significant inter-test reliability coefficients.

12. The Nelson-Denny test battery proved valuable when using the comprehension subtest for grouping purposes and demonstrates statistically significant inter-test correlation.

The statistically significant gains made by all groups in rate and in rate of comprehension, as well as, Group II and III in comprehension on the Nelson-Denny are considered above normal expectations for reading instructional programs that emphasize the multifaceted approach to reading improvement. The lack of statistically significant findings between pre-test and post-test

scores on the comprehension and vocabulary tests when using the ORA may be due to shortness of the test itself.

In all groups, activities outside the confines of the class may have contributed to gains on criterion measures. Also, (1) significant positive effects obtained between pre-test and post-test may be due to the specificity of the reading instructional program, (2) program content for the classes included materials similar to the components that made up the test batteries; and (3) the amount of test learning or test sophistication from pre-test to post-test administration cannot be discounted.

There are several implications as a result of this study. The investigation revealed the importance of systematic reading instruction on selected varible factors necessary for being a successful reader at the collegeate level. It becomes obvious that reading rate and comprehension can be markedly improved regardless of the reading level of the college student. The factor of rate of comprehension becomes a very accurate measure when used in combination with the factors of rate and comprehension. This factor permits the instructor to interpret for the layman what may appear to be an apparent loss in comprehension. A simple example being the student who progresses from 200 words per minute at 80% comprehension or 160 words per minute rate of comprehension to 400 words per minute at 70% or 280 words per minute rate of comprehension. The growth per minute in rate of comprehending the material increased 120 words per minute.

The subjects were given what is considered a strong vocabulary program and many observable gains were noted although statistically significant results were not obtained. Therefore, it was observed that future investigations of this type should utilize independent vocabulary pre- and post-tests if materials that are used in the instructional program differentiate from those materials that are included in the ORA and the Nelson-Denny. It would also seem appropriate to design a study of similar nature using subjects from the same performance groups but varying the instructional approaches. For example, high intensity vocabulary vs. traditional model. Introduce experimental controls and study among group effects by using independent observation technique rather than the paired observation technique.

It becomes apparent that certain students at the college level need reading instruction and that all students can profit from systematic instruction in reading regardless of their performance level. Therefore, it would behoove an institution of higher learning to embark upon a program of reading instruction that would not only identify the "poor reader", but would make available to all students the opportunity to improve existing skills, as well as providing the remedy for any deficiencies that might exist in the population being served by the institution. To implement a program of this type, the Nelson-Denny or the quick screening ORA test could be administered to all incoming students. As a result certain students could be advised to take a reading instructional program as described in this study.

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APPENDICES

APPENDIX A

THE INSTRUCTIONAL PROGRAM OF THE TROY STATE UNIVERSITY READING IMPROVEMENT COURSE

The reading instructional classes meet three days per week for eight weeks.

The initial phase of the program consists of diagnosis of strengths and weaknesses and planning an individualized efficiency systems approach. The Optimum Reading Achievement Exercises, Nelson-Denny Reading Test, Word Power Made Easy Survey and other informal tests are used in diagnosis.

The Shadowscope Pacer is used in each carrel in coordination with the three levels of the Optimum Reading Achievement Books (ORA) ranging from grades seven through twelve. The ORA progress charts are also used. The program combines the ORA exercises with the T-Matic and Tachomatic 500 films and use of the Craig Reader Program. The course utilizes the Range of College Reading for some study type reading. The only text required of all students is Word Power Made Easy by Norman Lewis, published by Pocket Books, Inc. The course requires weekly vocabulary tests and the book is completed during the quarter.

A strong emphasis is placed on self-guidance, motivation and study skills in addition to reading improvement. The Earl Nightingale Casetpak Library (books and tapes) are utilized very effectively for motivation and reading. On Becoming an Educated Person, by Volks and So You're a College Freshman by Chapman are utilized if the student has this need. Individuals may substitute

the Science Research Associates (SRA) Reading Lab and/or SRA Read for Understanding Lab in place of some pacer work.

The first three weeks the course basically follows the ORA program on the pacer in combination with the Tachomatic training films in three fixations per line, then two, then whole lines. During the fourth, fifth, and sixth weeks students concentrate on study type reading in which the students' own textbooks are used as part of the training. During the seventh and eighth weeks some students complete some of the ORA exercises 11-18. These eight exercises are done without the Pacer, with the teacher pacing the student with a stopwatch and/or the student pacing himself. Some students move into speed reading on paperbacks in this phase of the course. Seven Reading Strategies by Baldridge Reading Instruction Materials, Inc. is used to teach the reading theory. The students teach to each other strategies of the class in the form of "mini-lessons."

All students complete a minimum number of lessons on the Craig Reader to assure tachistoscopic and pacing training. The level of the material and the rate are individually prescribed. An individual may progress through only one or all phases of the instructional program.